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among the larger members of the Felidæ than among the slow moving, inoffensive and herbivorous Edentates. Consequently if there be any truth whatever in these tales or traditions they probably refer to this large cat. Dr. Roth has referred these cat remains to Ameghino's species, retaining the specific name of *Listai* proposed by Ameghino. He rejects the generic name of *Neomylodon*, which would then clearly be a misnomer and substitutes the Indian name of *Iemisch* by which, according to Ameghino, the animal is known among the Indians. Two objections may be offered to this generic name, first its barbarous origin, which though not absolutely prohibited by rules governing the formation of such names should nevertheless be discouraged, and second, the material upon which it is based has not been shown to be distinct from either *Smylodon* or *Felis*.

In *Iemisch Listai* we have an instance in Zoological Science, which if not unique, it surely ought to be, of a species in which the original type may be fairly said to consist of traditions, collected among an entirely uncivilized people. For it is upon these Indian tales that the description given by Dr. Ameghino not only as to the habits but also as to the color, number and character of the toes on each foot, size of head, length and prehensile nature of tail, etc., are based.

Regarding the existence of such traditions among the Indians of Patagonia, I can only say that during the three years spent by myself there, during which I was frequently thrown among the southern Indians, I learned of no such traditions from the Indians themselves. If any such traditions exist among them, they certainly have not engendered that feeling of terror and fear of this animal as pictured by Ameghino, for I have frequently camped with the Indians in regions said by Ameghino to be the traditional or reported haunts of *Iemisch*, and have never observed them to take any special care for themselves or their horses, leaving the latter loose, picketed and hobbled in great numbers night and day alike.

From a study of the cave and the condition in which the remains were found, Dr. Hauthal concludes that man and all the other animals of which associated remains were found, coëxisted

here during an interglacial period and that these caves were occupied as habitations by the men who shared them with certain domesticated animals among which was the large Edentate, *Grypotherium domesticum*. This opinion is also shared by Dr. Roth and less strongly, if I mistake not, by Dr. Nitsche who discusses the material from an archæologic standpoint.

The papers are extremely interesting and are important not only for the light they throw on the nature of the 'Mysterious Mammal of Patagonia,' but also for the additional evidence afforded of the existence of representatives of the Pampean fauna in comparatively very recent times. We may expect further explorations of these cave deposits to bring to light additional remains and perhaps establish their correlation with deposits in the north.

J. B. HATCHER.

Maryland Weather Service. Volume I. Baltimore, Md., The John Hopkins Press. 1899. 4to. Pp. 566. Charts LIV. Figs. 61.

If the succeeding volumes of the Maryland State Weather Service are kept up to the standard and size of the first volume, and if the scheme of work outlined in the present publication is followed out, it is safe to say that a new era has opened for climatology in this country. That this rich promise for the future will be fulfilled no one can doubt who knows the men in charge of, and interested in the Maryland Weather Service, and who appreciates the peculiarly favorable position which this service occupies, carried on as it is under the joint auspices of the Johns Hopkins University and of the United States Weather Bureau.

The Director of the Service is Professor William B. Clark, of Johns Hopkins University, whose special interest in geology has never caused him to neglect the scientific study of meteorology. The Secretary and Treasurer is Professor Milton Whitney, Chief of the Division of Soils of the Department of Agriculture, who represents the Maryland Agricultural College, and is well known in connection with his work on the relations of soils to climate and crops. The Meteorologist in charge is Mr. F. J. Walz, of the United States Weather Bureau, who is

detailed by the Chief of the Bureau to supervise the Weather Service work in Maryland, and who has carried on this work most successfully for several years. Dr. Oliver L. Fassig, Instructor in Climatology in Johns Hopkins University, and also an official of the United States Weather Bureau, who contributes an important paper to this volume, has been doing most effective work at his university through his lectures, and through his unique but most valuable summer field courses in observational meteorology. Dr. Fassig was formerly Librarian of the United States Weather Bureau in Washington; he has had the advantage of study under the leading European meteorologists, and under Professor Cleveland Abbe, the foremost meteorologist in this country, and is doing a great deal to further the advance of scientific meteorology in the United States. Finally, Professor Abbe himself, although not officially connected with the Maryland Weather Service, has had a great interest in its work, and has shown his interest by recently presenting the whole of his valuable meteorological library to Johns Hopkins University. In addition to this most happy association of men, admirably equipped for their work, the Maryland Weather Service has had the heartiest co-operation on all sides from National and State scientific departments.

We have spoken at some length of the personnel of the Maryland Weather Service, because such men are bound to produce excellent results, and this is the secret of the high quality of the present volume, which is emphatically *bahnbrechend*. It remains for us to note, as briefly as may be, the contents of the book.

An *Introduction* by Professor Clark gives the chief facts regarding the establishment of the Weather Service, and discusses the scope of the work now being carried on, or proposed for the future. We agree thoroughly with the Director in his views as to the range of subjects which fall within the limits of climatologic study. We believe, with Professor Clark, that climate cannot be studied without a knowledge of the physiography of the region under discussion, and that the disposition of the rainfall, the relations of the climate to health and disease, the character of forest growth, the distribution of

plant and animal life, the relations of climatic conditions to human life and activities, these, and still other topics, deserve treatment in a complete investigation of any climate.

A general report on the Physiography of Maryland follows the introduction. This report, by Dr. Cleveland Abbe, Jr., is just in the right place in the volume. A physiographic basis is essential to the scientific study of climates; therefore the surface features of a country need consideration before the meteorological data are discussed. Dr. Abbe's report is written from the point of view of the new geography, and is clearly the result of careful and extended study. Doubtless this report will shortly be reviewed in this JOURNAL, and further mention of it is therefore omitted. A word may, however, be said regarding the illustrations, in the way of maps, sections and heliotype views, which serve to give the student of climatology who has the misfortune not to know Maryland from his own observations, a vivid idea of the chief topographic features of the state.

Part III., a report on the meteorology of Maryland, was prepared, by direction of Willis L. Moore, Chief of the Weather Bureau, by Professor Cleveland Abbe, Dr. Oliver L. Fassig and Mr. F. J. Walz. The first paper, by Professor Abbe, concerns the *Aims and Methods of Meteorological Work especially as conducted by National and State Weather Services*. This paper is divided into several sections, the first of which, on *Dynamic Meteorology and its Applications*, deals with the history of weather maps, clouds and cloud charts, weather forecasts and analytical and experimental research work in meteorology. This section is illustrated by means of the Hydrographic Office colored cloud views, first published in 1897, and by means of a series of weather maps. Professor Abbe's interest in all that tends to the advancement of the higher meteorology is well known, and in this paper he has enumerated many problems for special research and observation, which we heartily commend to the attention of those teachers who are fortunate enough to have facilities which enable them to offer their students such work to do, and who have the students who wish to do the work. The second

section of Professor Abbe's paper concerns *Climatology and its Aims and Methods*, and deals chiefly with the relations of climate to vegetation. Some years ago Professor Abbe made a careful study of the latter subject, and, although he has never published any extended report upon it, he has often referred to the results to which his studies led him. We take it that these pages of the Maryland Weather Service volume contain a summary of the results which Professor Abbe reached, and we welcome them as giving the best brief statement of the most important facts in the complicated inter-relations of climate and the products of the soil. Soil temperatures; the climatic influence of forests and agriculture; reforestation; the geographical distribution of plants, etc., are considered. The third section of Professor Abbe's report deals with *Apparatus and Methods*, and is the first publication on this subject we have yet seen which illustrates the different instruments altogether by means of photographic reproductions.

A Sketch of the Progress of Meteorology in Maryland and Delaware, by Dr. Fassig, follows, and is an extremely interesting historical account. We note, in passing, that Dr. Fassig reproduces Lewis Evans's map of 1749, which contained the famous statement concerning the movements of northeast storms from the southwest. A copy of the original map, published in 1747, Dr. Fassig was unable to find; he has therefore reproduced the second map, dated two years later. Credit has sometimes been given to Evans for the first statement of this important discovery, but it justly belongs to Franklin, as Dr. Fassig says. This paper contains a valuable bibliography of publications relating to the climatology of Maryland.

The final report, by Mr. F. J. Walz, an *Outline of Present Knowledge of the Meteorology and Climatology of Maryland*, is a very complete account, containing full tables and many figures and charts. We note, with pleasure, a classification of Maryland weather into types, illustrated by means of weather maps, for climatology does not become a living study until the weather phenomena which go to make it up are understood. Mr. Walz has given us a climatic account of Maryland which is brought

quite down to date, and which may well be adopted as a model by those who discuss the climates of other states. Excellent shaded charts showing precipitation and isotherms for each month, for the seasons, and for the year, accompany the report. Figures 35-40 are new. They are weather wind roses, and show the weather and wind conditions when Baltimore is under the influence of a cyclone and anti-cyclone in different seasons. Figure 55, the advent of spring in Maryland, is also an interesting addition to our knowledge of the climate of the state.

We have exceeded the limits which we set for this review at the outset, but we believe that the volume under discussion has been given no more space in this JOURNAL than it deserves. Paper, press-work and illustrations are all of the highest grade.

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Indicators and Test Papers, their Source, Preparation, Application and Tests for Sensitiveness.
By ALFRED I. COHN, PH.G. New York,
John Wiley & Sons. 1899. Pp. 224.

As stated on the title page, this work is "a résumé of the current facts regarding the action and application of the indicators and test papers which have been proposed from time to time, and are in present use in chemical manipulations."

Part I. (pp. 19) deals with the general considerations determining the choice of indicators, their applications and limitations, behavior in other than aqueous solutions, dissociating effect of solvents, theory of their action, etc.

Part II. (pp. 154) is devoted to a discussion of a great number (76) of indicators, including not only those in common use, but also a great many others whose use has been recommended from time to time. The arrangement is alphabetical throughout, the data for each indicator being arranged under the following headings: Synonyms, Source, Preparation, Properties, and Application.

Part III. (pp. 51), on Test Papers, records the preparations and properties of 74 varieties, and is followed by tables showing the relative sensitiveness of indicators and test papers, and a